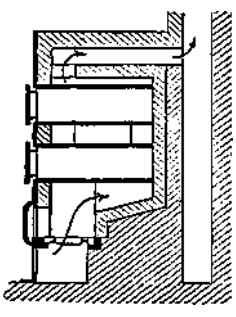
Figs. 94 and 95 show sketches of this type of kiln. Combustion occurs in chamber III; the air is being preheated in chambers I and II, and the bricks are being preheated in chambers IV and V. The gases which are cooling have a downward flow, while the air which is being heated flows upward; the circulation of the gases is therefore correct. The change in direction of the flow of the gaseous currents is effected by a system of channels or flues in the walls separating the chambers: channels 6161, 6262, &3&s . . . for the air and *d|d|, d^dz, feds* . . . for the products of combustion. When the products of combustion are passing into a chamber (for example, IV), the flues *dd* are open and the flues *bb* are closed. The opening and closing of the flues *bb* and *dd* is accomplished in a very simple manner by the damper brick shown in dotted lines.

The kiln which is designed according to this method is very simple in construction, and the author will enter into correspondence with any reader who may be interested in it. From this short description of the ring tunnel or chamber kiln it may be seen that it is not difficult to construct a continuous kiln which will operate in a satisfactory manner through the rational flow of the air and the products of combustion.

XI. MUFFLE FURNACES



For tne annealing and tempering of steel, the annealing of brass and bronze and for other purposes, muffle furnaces possess

many advantages. A uniform temperature, the absence of jets of flame, the small amount of oxidization and the protection of the surface of the material being heated (a condition very important in the stamping of metals) make these furnaces a type much favored in these works, despite the fact that the muffles deteriorate quite rapidly. If the currents of hot gases are circulated in a rational manner, muffles of steel castings will give a service of several years. Unfortunately, the great importance which attaches to the correct circulation of the hot gases is not well known.

j?IG 95

Fig. 96 shows a muffle furnace which is widely used. The flame and hot gases are produced in a firebox